HZI, Besix and Itochu

Dubai Waste Management Center

Environmental Impact Assessment Rev 6

June 2020

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Executive Summary

Introduction

Dubai Municipality (DM) (the Project Proponent) proposes the development of the Dubai Waste Management Center, a proposed Waste-to-Energy Plant (WtE plant), (Project) (Figure 1) at the existing DM owned and operated vehicle storage site in Warsan, Dubai. The proposed WtE plant will treat about 1,888,000 tonnes of municipal solid waste (MSW) per year, with an estimated nominal design capacity of 5,666 tonnes per day (tpd)) at 9.5 MJ/kg net calorific value (NCV), to generate an average net power output of 193 MW of electricity to power about 135,000 homes.

Under contract with the Project Proponent, Hitachi Zosen Inova (HZI), a global leader in Energy-from-Waste (EfW) technology, NV Besix SA, Sharjah branch (BESIX), a Belgian construction company, and Itochu, a Japanese company formed a partnership to build, operate and transfer (BOT) the WtE plant over a 35-year period. The contract is shared between a Special Project Vehicle (SPV) and Engineering, Procurement and Construction (EPC) partnership and Operations and Maintenance (O&M) partnership.

HZI commissioned GHD Global Pty Ltd (GHD) as the Project environmental consultant for the Project. The application for environmental clearance is made to the Dubai Municipality-Environmental Department (DM-ED) in accordance with Technical Guidelines 1 (Environmental Impact Assessment) and 2 (EIA for Land Development, Infrastructure and Utility Projects) (March 2019).

To support funding applications from international lending institutions, the Project will also comply with international guidelines such as the Eqeuator Principles (EP), International Finance Corporations (IFC) Performance Standards, and World Bank (WB) Environment, Health and Safety Guidelines.

A Preliminary Environmental Approval (PEA) was issued by the Dubai Municipality-Environment Department (DM-ED) on 20 May 2019 (Ref. No. EPBI-200519-00125); however, it was cancelled on 17 July 2019 (EPBI/200519-00125) and a revised Environmental Impact Assessment Report (EIAR) Rev 4 was submitted on 3 October 2019 to present the following modifications to the Project:

- Design improvement
- 12 weeks Incinerated Bottom Ash (IBA) maturation
- Covered IBA Maturation Area
- Mobile waste shredder
- Installation of 132kV underground cable and connection to DM STP substation

An Environmental Clearance (EC Ref. No. EPBI-090719-00145) was issued by DM-ED on 13 October 2019 for EIAR Revision 4.

On 19 February 2020, the Project Company requested a re-submission of EIAR (Rev 5) to incorporate the conditions of the EC into the report. As a response, DM-ED issued a number of comments and clarifications. This EIAR Rev 6 addresses these comments and submitted for DM-ED approval.

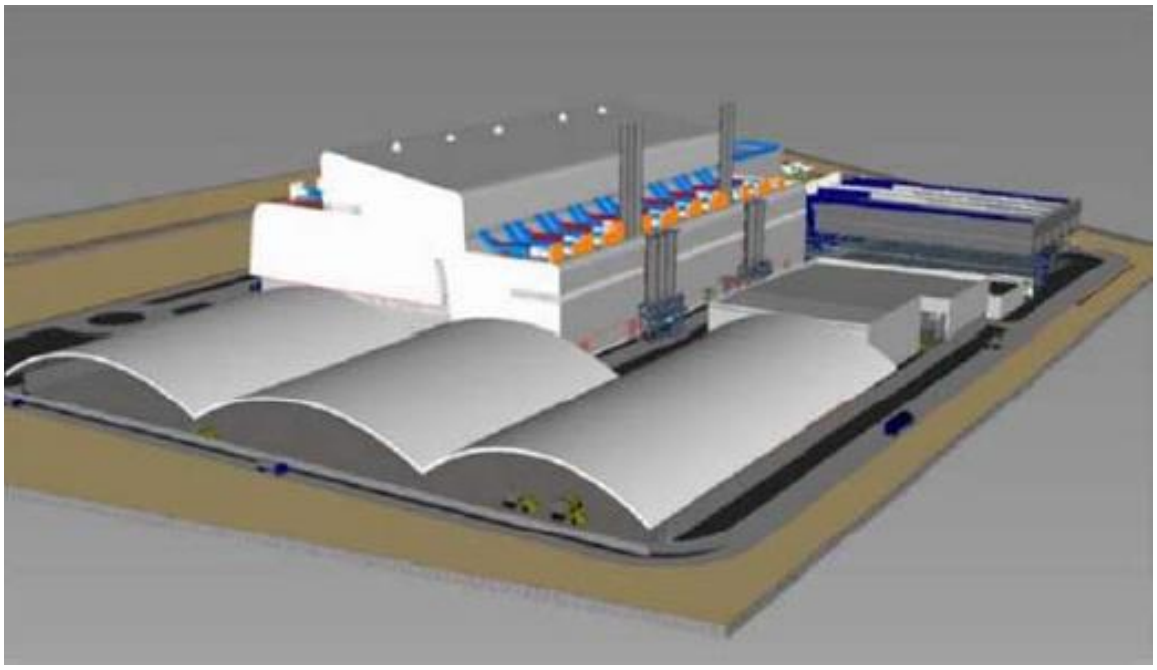


Figure 1 Dubai Waste Management Center Facility Rendering

Project Fact Sheet

Project Information	Description
Project Proponent	Dubai Municipality
SPV and EPC	HZI, Besix and Itochu
Project Name	Dubai Waste Management Center (Waste-to-Energy Plant)
Project Categorisation	According to DM-ED Technical Guideline No. 2 (March 2019), the Project requires the submission of Environmental Impact Assessment Report (EIAR).
	Under definition provided in Equator Principle 1 (2013), the Project is classified as Category A as it may potentially have significant adverse environmental and/or social impacts that can affect an area broader than the site that is subject to physical works. The impacts associated with the Project can be mitigated through appropriate environmental and social management and monitoring measures.
Design Capacity	5,666 tpd MSW at full capacity
Project Location	Al Warsan 2, Dubai, UAE
Total Area	506,096.14 m^2 (based on the Affection Plan)
Production Capacity	Average output of 193 MW at full capacity at 27°C ambient temperature
Design Standards	European Regulations/Industrial Emission Directive (Directive 2010/75/EU)

Project Information	Description
Manpower	Peak of construction: Over 2000 workers Normal operation conditions: 129 fulltime staff / workers Annual outage overhaul: Additional 120 external workers
Project Schedule	Detailed engineering is expected to be completed in Q2 2020. A three-year construction period is expected to commence in Q2 2020, and commissioning and trial run is anticipated 36 months after the start of construction.
Project Rationale	Consistent with the vision of the UAE towards integrated waste management and energy diversification in Dubai, the integrated strategic waste management master plan provides a roadmap for sustainable waste management practices in the Emirate of Dubai up to 2030. Key Performance Indicators (KPI) have been developed to drive the process of the waste management strategy, which include: minimising wastes, maximising environmentally sound waste reuse and recycling, promoting environmentally soune waste disposal and treatment and extending waste service coverage. A stable energy supply is anticipated to foster continued economic stability and growth in the country and surrounding areas. As such, the Project is considered to be in line with addressing the following overarching goals: • In line with 2050 Energy Strategy (MOEI, 2017) in diversifying energy resources (solar, nuclear, wind, WtE) • Assist the Emirate of Dubai reach its 98% landfill diversion target by 2030 (Mott MacDonald, 2013) • Support the goal of UAE Vision 2021 (i.e. avoid methane emission from landfills and fossil fuel displacement)

Project Structure

The Project is owned by DM. Under contract with the Project Owner, SPV, EPC and O&M have formed a partnership to build, operate and transfer (BOT) the WtE plant over a 35-year period. Various entities involved in the Project is shown in Figure 2.

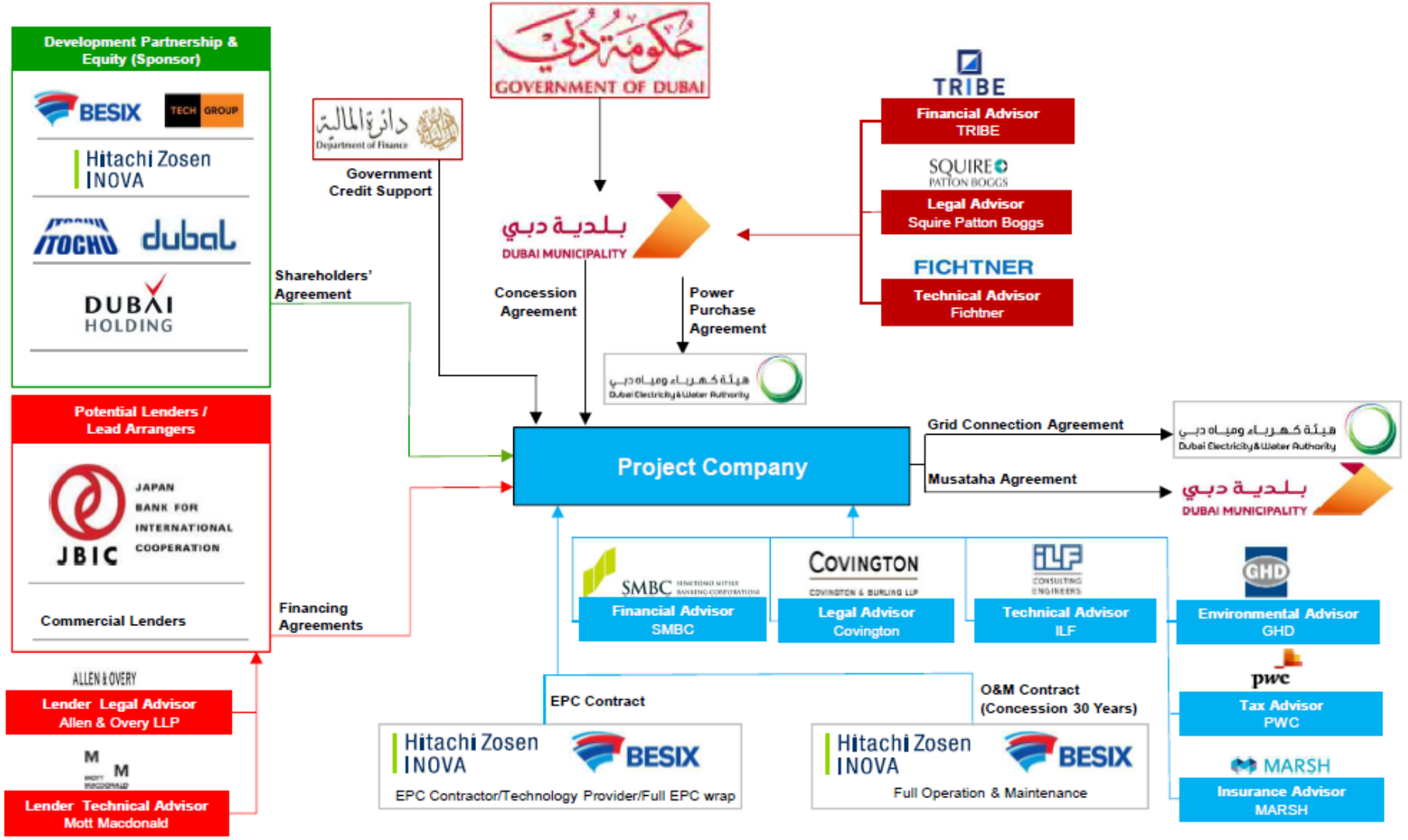


Figure 2 Project Structure

Project Location

The Project is proposed to be located at a DM-owned industrial site in Warsan, Dubai (specifically Warsan 2). The Project site is located within land comprises other DM functions including the Dubai Electricity and Water Authority (DEWA) Power Station to the southwest.

The site is located within a highly disturbed site within an operational industrial zone, with limited environmental flora and fauna values, and no wetlands or waterways present on site (Figure 3). There are no existing communities residing within the site limits that would be directly affected by the Project construction and operation phases.

Nearest residential area is located approximately 300 m north from the proposed site boundary. Individuals accessing the commercial and office facilities within the surrounding industrial and commercial areas may potentially be affected during the construction and operation of the Project.

There is currently an un-engineered Tadweer landfill located to the southwest of the Project.

There are no cultural sites within or surrounding the Project site (dubaiculture.gov.ae). The nearest cultural heritage site is the Al Fahidi Historical Neighborhood, which is about 18 km away from the site. The nearest protected area is the Al Wohoosh Desert Conservation Reserve located approximately 20 km east of the site.

Study Area

The EIA study was undertaken primarily within the vicinity of the proposed Project footprint and its potential impact areas. Baseline monitoring and sampling locations are provided in Figure 4.

Al Warga Residential Area 1, 2, 3, & 4

Dubai Safari Park

Dragon Mart Commercial Centre

E44 - Al Awir Road

Dragon Mart Mosque

Dubai Textile City

Pivot Fields

Desert Palm Polo Club and Hotel

Dubai International City (Phase 1)

Al Aweer STP

Site Limits

DM Plant Nursery

Warsan Lake

Impounding Areas

Tadweer **Dumpsite** (Unengineered)

Industries

Impounding Areas

DEWA Power Station

DEWA site office

Impounding Areas

D54 - Academic City Road

D67 - Manama Street

Dubai International

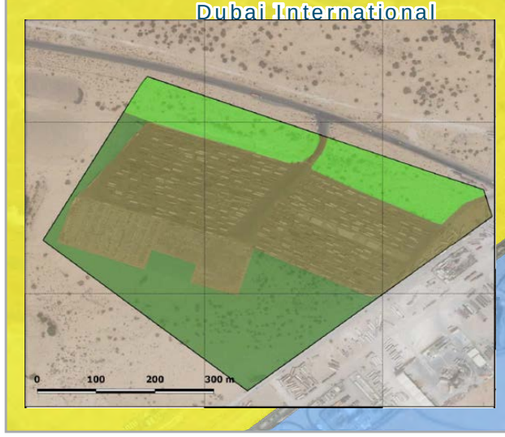
E611 - Emirates Baypass Road

Legend

Site Limits

Surrounding Landuse

- Academic City
- Commercial Area
- Industrial Area
- Place of Worship
- Residential Area
- Resource / Attraction



- Sand sheets and dunes with dwarf shrub cover (Habitat A and B)
- Disturbed Ground
- Project boundary

Paper Size ISO A3

0 200 400 600 800

Meters

Horizontal Datum: WGS 1984
Grid: GCS WGS 1984

N

HZI, Besix & Itochu
Dubai Waste Management Center
EIA

Project No. 76-10735
Revision No. A
Date 5/11/2018

Surrounding land use

FIGURE 3

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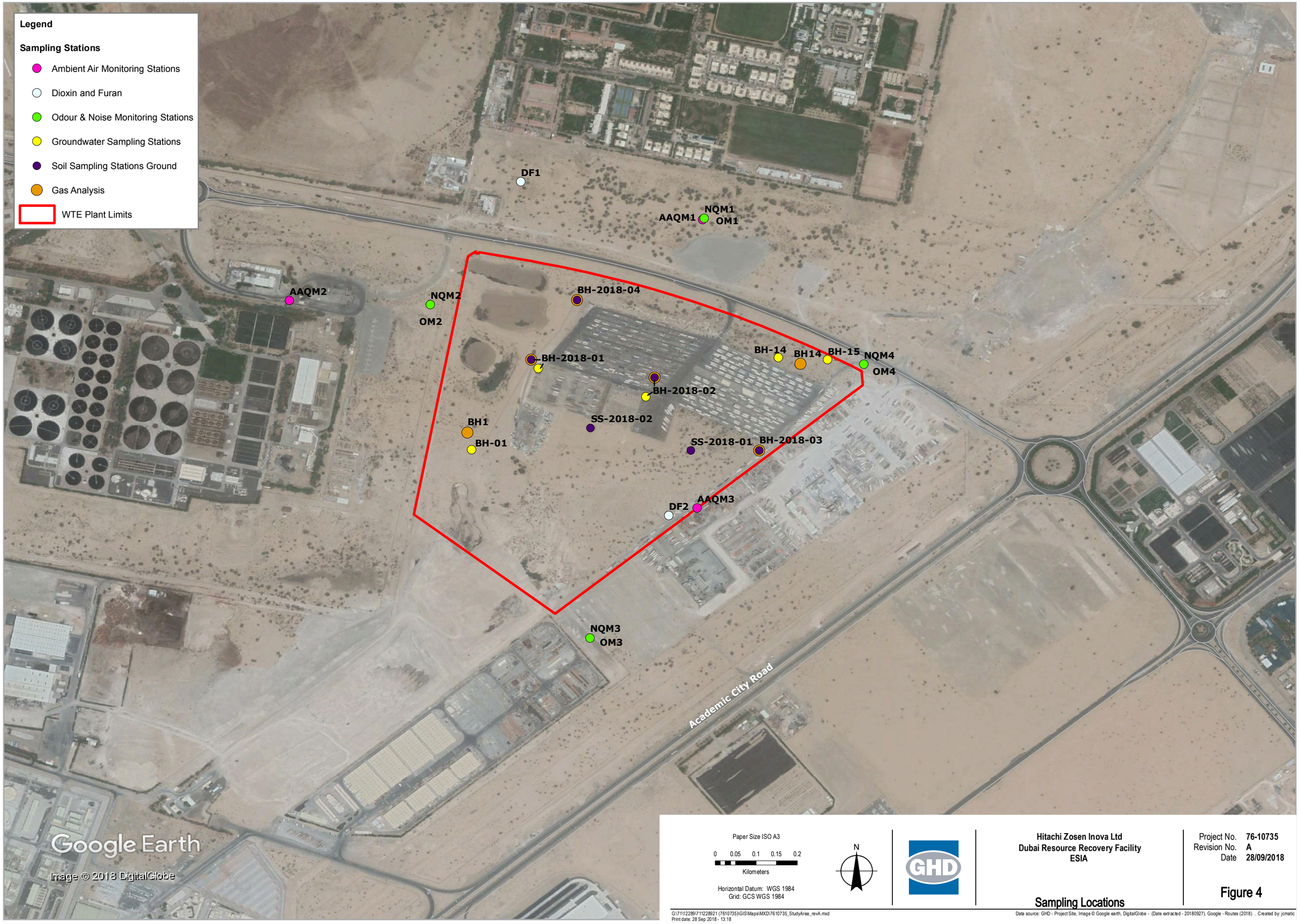

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Kilometers

Horizontal Datum: WGS 1984
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GHD

Hitachi Zosen Inova Ltd
Dubai Resource Recovery Facility
ESIA

Project No. 76-10735
Revision No. A
Date 28/09/2018

Sampling Locations

Figure 4

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Data source: GHD - Project Site, Image © Google earth, DigitalGlobe - (Date extracted - 20180927). Google - Routes (2018) . Created by: jcmatic

Schematic Diagram

The technological concent and the related volume streams for the proposed Project are illustrated in Figure 5.

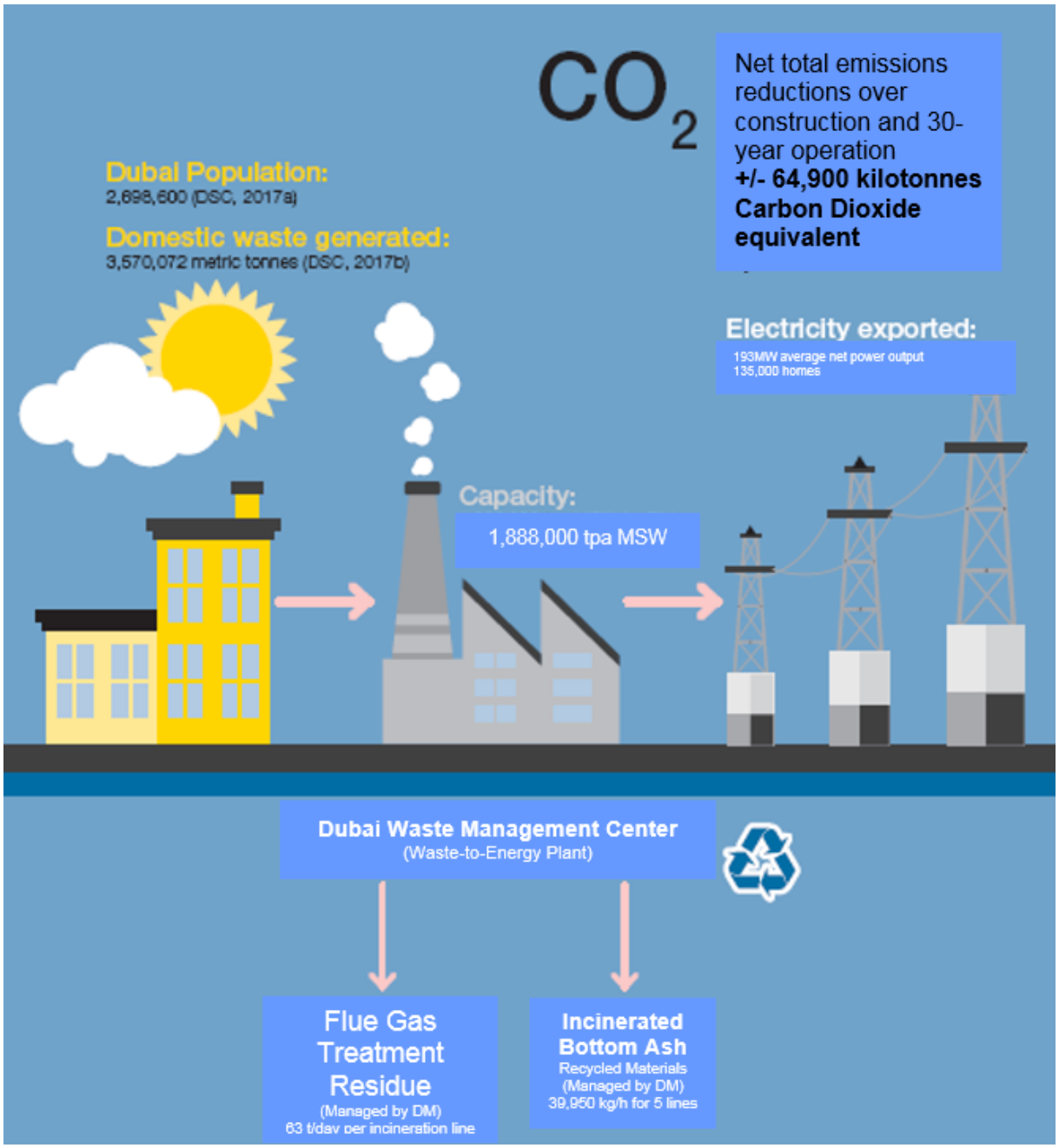

Figure 5 Schematic Diagram

Project Components

The general layout of the proposed WtE plant is provided in Figure 0-6. The WtE plant will comprise of the component provided in Table 0-1.

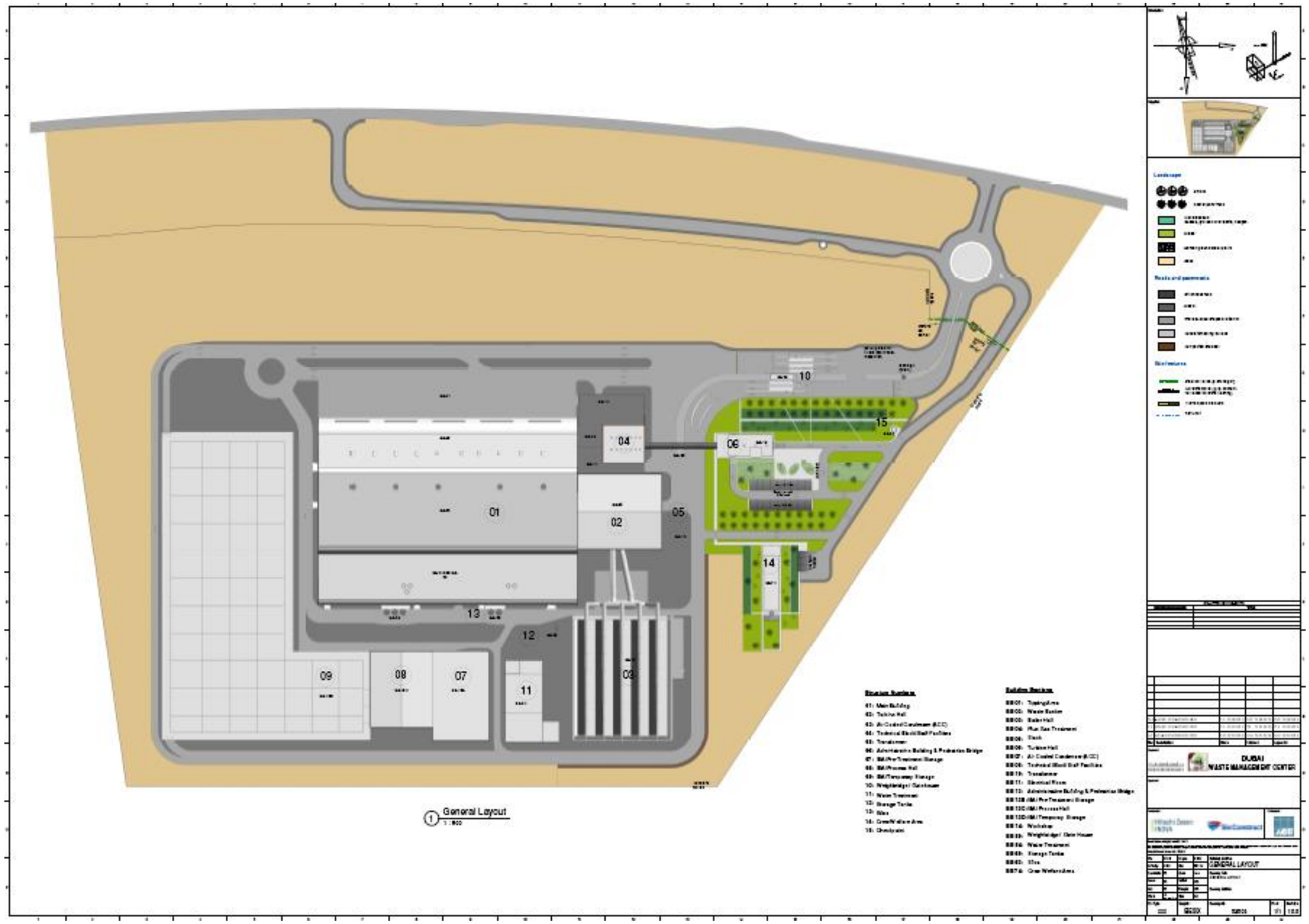

Figure 0-6 Project Layout

Table 0-1 Project Components

Buildings	Functional Description
Primary Supporting Facilities	
Administrative & Visitors Building and Operating and Maintenance Staff Facilities	The Administration Building will be designed and constructed to be able to accommodate 20 people on a permanent basis and additionally up to approximately 30 visitors on a temporary basis. The building comprises (i) offices and meeting rooms, (ii) cafeteria, (iii) archive room and storage rooms for office and cleaning supplies, (iv) restrooms, (v) kitchen, (vi) exhibition space, (vii) visitor area, (viii) training room and (ix)lifts for personnel.
Guardhouse	Trucks entry and exit
Weighbridge	Weighing of the waste deliveries (incoming truck weight minus outgoing truck weight) and acquisition of all relevant delivery data for inventory control. • Number of truck scales: 3 in - 2 out • Peak hourly truck entry: 80 trucks / h • Type truck scale: pit type / pitless type • Annual availability: 8,760 h/y / 24 h/day • Low and high temperatures:10 to 55ºC • Size of each platform (Length x width): 18m x 3m • Weighing range: 0.4-60 Mg • Weighing scaling intervals: max. 20kg • Horizontal movement of the platform in each direction: max. 10mm • Number of load cells per platform: 8 • Type of cell: digital • Load capacity per cell: Mg • Weighing accuracy according to OIML Standards: Class III • Weighing accuracy: Max. 0.025%

Buildings	Functional Description
	• Automatic vehicle identification: • Automatic ticket dispenser: 1 (exit scale) • Alphanumeric display and Intercom system: 2, one per scale • Automatic barriers: 2, one per scale Weighing software and complete PC with mouse, printer and screen
Checkpoint	Staff and visitors entry & exit
Accommodation Building	To accommodate 120 people
Primary Technical Buildings	
Main Electrical Station	The steam turbine generator will be connected through the Generator Circuit Breaker (GCB) to the Generator Step up Transformer. When sufficient steam is produced, the generator will be synchronized to the 132 kV grid. Once synchronized, the net power production is delivered to the Grid. The Facility electrical auxiliary system is fed from the 6.6kV metal-clad switchgear, which is connected to the Unit Auxiliary Transformer. The plant system will be supplied from the 6.6kV switchgear. Dry type distribution transformers 6.6kV/0.4kV will be used for low voltage consumers. Two (2) Emergency diesel generators for safe shut-down will be installed and connected to the 6.6 kV switchboard. In the event of total power failure, the redundant steady-state uninterruptible power supply system provides for the continuity of the power supply for the operational instrumentation and control system, i.e. the power supply for instrumentation, monitoring systems, the voice communications equipment, as well as the control voltage of the HV, MV and LV system.
Main Process Building: 1) Tipping Bay	The tipping bays allow the transfer of the waste from the reception area to the waste bunker and guide the waste trucks in the tipping area. The waste delivery trucks back up to their assigned tipping bay made of concrete and unload their load into the waste bunker. Air is drawn

Buildings	Functional Description
	from the waste bunker into the furnace combustion air. The resulting negative pressure within the waste bunker mitigates potential fugitive emissions of dust and odour from leaving the waste bunker.
2) Waste Bunker	Dimensions of waste bunker 1 (2 lines): • Width – 56.0 m • Height – 33.0 m • Depth – 23.0 m • Volume – 42,504 m^3 Dimension of waste bunker 2 (3 lines) • Width – 87 m • Height 33 m • Depth 23 m • Volume 66,033 m^3
3) Mobile Waste Shredder	The mobile waste shredder will be used for processing bulky waste, as a contingency plan should waste be received at the site that is unsuitable for feedstock to the incinerator lines.
4) Boiler Hall	The boiler converts the heat of the flue gas into superheated steam. It is designed as a natural circulation boiler and is diviced into five main subsystems: (i) the economiser system, (ii) the evaporator system, (iii) the superheater system, (iv) the boiler drum and (v) the boiler blow down.
5) Flue Gas Treatment (FGT) system	The dry flue gas treatment (FGT) process is designed to remove all dust particles, most of the acidic gaseous contaminants, by neutralisation with hydrated lime and organic pollutants (PCDD/F) as well as mercury and other heavy metals by adsorption on lignite coke. The system consists of a reactor with additive injection, fabric filter for solid-gas separation and residue recirculation. *SNCR Process* NOx reduction occurs in the combustion zone where an aqueous solution of urea is injected into the flue gas stream leaving the grate and reacts selectively with the NOx in the combustion chamber.

Buildings	Functional Description
	The DyNOR™ system is an advanced SNCR (Selective Non Catalytic Reduction) system, which has been developed with the objective to meet new European NOx standards with a SNCR-system.
6) Stacks	The stack expels the purged flue gas after the flue gas cleaning system to the atmosphere. Each incinerator line has one single self-standing stack of 70 m height. The Project comprise of five incineration lines; as such, a total of five stacks grouped in two and three is anticipated. NOx emission from the stacks will be reduced with the use of SNCR / DyNOR system.
Turbine Hall	The steam is transformed into electrical energy in a turbo-generator set that is used to cover the plant's own electricity needs and to feed to the public electrical grid. The primary elements of the heat utilization include (i) turbine unit, (ii) control and lubrication oil supply, (iii) generator, and (iv) cooling system.
Technical Block, Workshop and Electrical Rooms	*Technical Block*. The Technical Block will be designed and constructed to be able to accommodate 60 people during the dayshift and 17 people during the other shifts. In addition, during the 3-week overhaul period per individual line, there will be an additional 80-120 external workers using the locker rooms, showers and kitchen/canteen in the Technical Block. These overhauls will occur five times per year (because there are five lines). The technical block will comprise (i) kitchen, (ii) cafeteria, (iii) first aid room (or plant clinic), (iv) prayer rooms, (v) locker room, (vi) lift for personnel, and (vii) toilets for male and femal employees. *Workshop*. The Workshop will include maintenance manager's office, store room, large ans small spare parts storage, electrical workshop, instrumentation workshop, mechanical workshop, open area (e.g. for fabrication, temporary laydown), and storage for consumables (i.e. lubricants, etc.)
Air Cool Condenser	During regular plant operation, the exhaust steam from the turbine condenses in the air-cooled condenser (ACC), which is situated beside the turbine house. In case of start-up, shutdown, overload or trip of the turbine, all or a part of the live stream flows into the ACC via the turbine bypass system. The thermal capacity of the ACC is high enough so that it is able to condensate the saturated steam that bypasses the turbine at an ambient temperature of 45 ºC. In transitions from normal operation to exceptional cases, such as "island mode" and by-pass operation, excess steam may need to be blown off for a short period of time during in order to prevent a possible shutdown of the turbine or the plant. At ambient temperatures over

Buildings	Functional Description
	approximately 35°C, it may also be necessary to reduce the boiler load during island mode operation or for the transition from by-pass operation to normal turbine operation.
Bottom Ash Maturation Area	The bottom ash maturation area is where the incinerated bottom ash will be temporarily stored before removal from the site to an off-site location. It will comprise of the following: • IBA Pre-treatment hall where the IBA is stored up to five days to reduce moisture content prior to treatment / metal separation • IBA Process Hall where IBA are segregated into 0–10 mm, 10–40 mm and 40–200 mm fractions and ferrous and non-ferrous metals separation takes place • IBA Maturation area where the clean mineral fractions are stockpiled up to a maximum height of 4m. The setting and leaching processes are undertaken in this covered area which can take up to 12 weeks depending on the bottom ash composition. After this temporarily storage the material will be removed from site to an off-site location.
FGT Silos	The residue storage silo is an interim / temporary storage for the FGT residues. The silos are placed on an elevated steel structure prepared to the moistening system for open truck discharge. A total of five silos for the whole Dubai WtE plant are anticipated. Each silo has an storage volume of approximatly 350 m^3, corresponding to approximately four days storage capacity
Storage Tanks	Storage area for the following materials are anticipated: (i) fuel, (ii) aqueous urea solution, (iii) solid additives [hydrated lime], (iv) adsorbent, and (v) inert gas supply.
Installation of 132kV underground Cable and connection to DM substation	The Project will be connected through a high voltage (HV) single circuit to the DM STP substation.
Water Treatment Plant (WTP)	The WTP will treat secondary water. The key process elements for water treatment are as follows: • Pre-treatment. Comprise of de-oiling filter, ultra-filtration and activated carbon filters. This pre-treatment system is designed to produce water quality suitable to feed the demineralization unit. The water produced in this system will also be used as service water for the Project.

Buildings	Functional Description
	• Demineralization. This system is designed to produce softened water for the Air Cooled Condenser (ACC) and Close Unit Cooling Water (CCW) system.

Key Sensitive Receptors

Sensitive receptors are areas and environments where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides, and other pollutants (EPA, 2017). This typically includes, but is not limited to, hospitals, schools, daycare facilities, elderly housing and convalescent facilities.

Sensitive receptors categories relative to the Project, as per DM Technical Guideline No. 2 (2018), are shown in Figure 7 and described below:

- High Sensitivity (Type 1 Area) – high density residential block, hospitals and school premises
- Moderate Sensitivity (Type 2 Area) – light density residential block, public parks and natural body of water
- Light Sensitivity (Type 3 Area) – commercial buildings, offices and other public areas; agricultural crops and farmland
- Marginal Sensitivity (Type 4 Area) – industrial area

5 km

1 km

Al Warga **2**

Al Warga **3**

Al Warga 1

Al Warga **4**

Al Warga **5**

Water Reservoir

Dubai Safari Park

Wadi Al Shabak Army Training Camp

Ras Al Khor

Dragon Mart Commercial Centre

Dragon Mart Mosque

Dubai Textile City

Dubai International City (Phase 1)

E44 - Al Awir Road

Desert Palm Polo Club and Hotel

Pivot Fields

D67 - Manama Street

Al Aweer STP

SITE LIMITS

DM Plant Nursery

Warsan Lake

Tadweer Dumpsite

Impounding Areas

Industries

DEWA Power Station

DEWA site office

Dubai International City (Phase 2 ongoing contruction)

E611 - Emirates Baypass Road

New Dubai Police Academy

Dubai International Academic City (DIAC)

Dubai Silicon Oasis

D54 - Academic City Road

Ruwaya Village / Desert Rose (planned residential area)

Google Earth

Image © 2018 DigitalGlobe

Legend

- Site Limits
- Ring buffers from WTE Plant

Sensitive Receptors

- Type 1 Area - High Sensitivity
- Type 2 Area - Moderate Sensitivity
- Type 3 Area - Light Sensitivity
- Type 4 Area - Marginal Sensitivity

Paper Size ISO A3

0 0.5 1 1.5 2

Kilometers

N

Horizontal Datum: WGS 1984
Grid: GCS WGS 1984

GHD

HZI, Besix and Itochu
Dubai **Waste Management Center**
EIA

Sensitive Receptors

Project No. 76-10735
Revision No. B
Date 28/09/2018

FIGURE **7**

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Print date: 28 Sep 2018 - 13:07

Data source: GHD - Project Site, Sensitive receptors (2018). Image © Google/DigitalGlobe . Created by: jcmatic

Summary of Findings

The EIA has identified potential environmental and social impacts as well as mitigation or enhancement measures. The following section provides a summary of potential impacts associated with the Project.

It is concluded that the environmental and social impacts associated with the construction and operation of the WtE plant are manageable through the adoption and successful implementation of mitigation measures and the undertaking of the monitoring activities and do not present an unacceptable risk to the environment and social aspects.

Greenhouse Gas

Key features of the WtE greenhouse gas (GHG) emissions profile includes:

- The total construction emissions were estimated at 70 kt CO_2-e during the construction period of 49 months.
- The total emissions associated with operations were estimated as 25,300 kt CO_2-e over the project's 30 year lifetime.
- Emissions avoided by not sending waste to landfill were estimated as 71,700 kt CO_2-e over the project's 30 year lifetime equating to 2,400 kt CO_2-e avoided annually.
- Emissions avoided by generating electricity from waste were estimated as 18,600 kt CO_2-e over the project's 30 year lifetime equating to 620 kt CO_2-e avoided annually.
- Net total emissions reductions over the construction and operation stages were estimated at 64,900 kt CO_2-e.
- Average annual emissions reductions are estimated as 1.2 t CO_2-e/t waste treated.

GHG Assessment		
EIA Component	Construction Phase	Operation Phase
Impact Assessment	GHG emissions from consumption of fuel for commuting of construction personnel, delivery of construction materials and disposal of construction waste.	Emission from the WtE operation
Proposed Management	• Optimise energy efficiency • Implementation of waste management measures	Mitigation measure is not required as the impact is considered beneficial. The emisions from the WtE plant are more than offset by avoided landfill methane emissions and emissions from on-site electricity generation displacing existing sources
Residual Impact	No significant residual impact is anticipated with the implementation of management measures.	There will be a net positive impact from the operation of the WtE palnt, as it will result in a net total emissions reduction of 64,900 kt CO_2-e over the construction and operation phases.

Air Quality

Ambient air quality at the Project site and in the surrounding areas is influenced by the following:

- DEWA Power Station, with stationary source of emission, located to the southwest of the site
- Various industrial facilities to the immediate east and southeast of the Project site
- Combustion emissions from vehicles using the surrounding road infrastructure

A two-week ambient air monitoring program was undertaken at three sites in the vicinity of the Project site between 16 August to 9 September 2018. The results show that they were all compliant with the ambient air quality standards for all parameters specified by the UAE Federal Law and Dubai Municipality with the exception of PM_{10} at station AAQM2.

Air Quality Assessment		
EIA Component	Construction Phase	Operation Phase
Impact Assessment	Potential air quality impacts will be emissions from power generation sets and dust generation. Dust generated during construction, if properly mitigated, are not considered to represent significant source of emissions.	Air emissions for the facility will be emitted from five point sources (tall stacks) and IBA management area. Air quality criteria including Ministerial Order No. 12 of 2006, US OSHA 29 CFR Part 1910, USEPA NAAQs 40 CFR Part 50, WHO Ambient Quality Standards, the NSW AMMAAP and European Commission standards were reviewed, and the most appropriate of these used as a comparison to predict ground level concentrations (GLCs) of selected air pollutants. The results demonstrate predicted incremental GLCs for NO_2, SO_2, CO, TSP, PM_{10}, $PM_{2.5}$, HCl, HF, NH3, TCDD and Hg do not exceed the adopted assessment criteria, based on the stack characteristics and emission rates assumed for the Project. Results of the Air Quality Assessment are summarised below: • Predicted incremental 1-hour concentrations of Cd exceed the NSW AMMAAP guidelines, which is likely due to the conservative assumption that the IED emission limit of 0.05 mg/Nm^3, is 100% Cd as oppose to be the sum of Cd and thallium. Ambient concentrations of Cd associated with the stacks are likely to be lower in reality. The predicted annual concentrations of

Air Quality Assessment		
EIA Component	Construction Phase	Operation Phase
		Cd comply with the European Commission criteria at all sensitive receptors. • The maximum predicted cumulative concentration for 24-hour NO_2 exceeds the UAE criteria by 3%; however, the incremental concentration complies with the criteria. • The cumulative concentrations for PM_{10} exceed the UAE 24-hour and annual WHO criteria, while the cumulative concentrations for $PM_{2.5}$ exceed the WHO 24-hour and annual criteria due to the adopted background concentrations exceeding the criteria. • The incremental contribution of the WMC to TSP, PM_{10}, and $PM_{2.5}$ ambient concentrations are less than the respective assessment criteria, including the WHO Interim target 1.
Proposed Management	• All construction and maintenance equipment/vehicles to be maintained to manufacturers specifications • Defined haul routes to be used • Limit vehicular speed to 25 km/hour • Implement dust mitigation measures	Built-in (WtE plant design) management measures: use of flue gas treatment (FGT) system, which include: • Particle separation • Dry flue gas cleaning with lime and lignite coke • Selective non-catalytic reduction (SNCR) process).
Proposed Monitoring Programme	• Visual dust monitoring • Dust monitoring at one location where construction activities are undertaken.	• Stack emissions monitoring of parameters provided in the Continuous Environmental Monitoring System (CEMS) • Quarterly monitoring of HF, dioxin and furans, heavy metals, PM_{10} and $PM_{2.5}$ • Fixed and continuous monitoring of PM_{10} and $PM_{2.5}$ at one location

Air Quality Assessment		
EIA Component	Construction Phase	Operation Phase
Residual Impact	No significant residual impact is anticipated with the implementation of mitigation measures.	No significant residual impact is anticipated as the emissions from the WtE plant are more than offset by avoided landfill methane emissions and emissions from on-site electricity generation. The emission is extremely low since the Project is designed using Directive 2010/75/EU.

Odour

There are a number of potential odour sources around the proposed Project site. These include:

- The Tadweer landfill
- The Al Serkal/envirol grease trap waste recycling plant
- China state asphalt mixing plant
- Emirates beton readymix L.L.C (concentrate supplier)

A site investigation was undertaken to monitor the ambient air levels of odourous gases from potential odour sources around the Project site. Based on the odour monitoring results, majority of the target compounds were below the laboratory limit of detection.

Odour Assessment		
EIA Component	Construction Phase	Operation Phase
Impact Assessment	Poor management of sanitary and waste disposal facilities (e.g. septic tanks, putrescible waste bins) may result in odour causing a nuisance to people on or near the Project site. Good housekeeping, regular inspections and maintenance of waste disposal, transfer and storage facilities will minimise the risk of odour release.	The results of the dispersion modelling indicate that when negative pressure is maintained, predicted odour concentrations reaching the defined sensitive receptors will be undetectable to the majority of the population. If negative pressure is lost and a flow rate of 0.6 m/s is achieved, predicted odour concentrations at 7 out of 14 sensitive receptors should be undetectable. If worst case conditions prevailed resulting in a flow rate of 1.2 m/s during a loss of negative pressure, predicted odour concentrations at 2 out of 14 sensitive receptors should be undetectable.

Odour Assessment		
EIA Component	Construction Phase	Operation Phase
Proposed Management	• Locate toilet utilities, sewage tanks (if any) and waste storage facilities away from sensitive receptors • Maintain the sanitary and waste disposal facilities in good and clean conditions • Regular off-site disposal of waste	• Avoid waste storage for more than five days in the waste bunker • Installation of tipping bay gates • Ventilation / slight negative pressure at the waste bunker • Maintain operation of four out of five lines at any time to maintain slight negative pressure in the waste bunker
Proposed Monitoring Programme	• Not required as potential impact is negligible. • Complaints from surrounding land users will be recorded and addressed.	• Fixed and continuous monitoring of H_2S, NH_3, mercaptans, DMS and DMDS at two locations
Residual Impact	No significance residual impact is anticipated with the implementation of mitigation measures.	Residual impact is not anticipated as the emissions from the WtE plant are more than offset by avoided landfill odour emissions. Built-in odour management measures (e.g. tipping bays and ventilation at the waste bunker) will be installed to avoid odour emission.

Noise

Baseline noise monitoring was undertaken at four sites on 18 and 19 August 2018. The monitoring locations were selected due to their proximity sensitive receptors, which has the potential to be impacted by noise.

Noise monitoring results showed that average measurements (LAeq) recorded during daytime were compliant with the UAE Federal and World Bank Guidelines. Nighttime measurements at NQM1 exceeded the World Bank limit of 45 dBA during both weekends and weekdays. NQM1 is adjacent to an internal road leading to the industrial area. The exceedances are most likely associated with vehicle movement on the road as well as sound of insects/animals. An exceedance of the Federal Limit was also recorded at NQM4 on a weekday, where a minor exceedance of 1 dBA was recorded during night time. The minor exceedance is most likely attributed to passing vehicles.

Noise Assessment		
EIA Component	Construction Phase	Operation Phase
Impact Assessment	Construction noise is anticipated due to movement of heavy machinery moving about the Project site and operation of construction equipment. During any given period, the machinery items used in the Project area will operate at maximum sound power levels for only brief times. Thus, construction noise emissions will be intermittent and of short duration.	An impact assessment was performed to determine the severity of the impact of the Project operation at the nearest sensitive receptor. Based on the noise modelling, the impacts of the operational noise assessment at the identified sensitive receptor is predicted to be negligible for both daytime and night time.
Proposed Management	• Appropriate site layout (locate primary noise sources away from sensitive receptors • Maintain equipment in good working condition • Limit general construction activities to daytime (7 am to 8 pm)	Implement engineering measures: • Provide built-in insulation walls • Locate buildings close to the Project's boundary to provide shielding • Enclose plant / equipment considered causing major source of noise • Select quiet equipment
Proposed Monitoring Programme	• Noise monitoring at one location where construction activities are undertaken.	Fixed and continuous noise monitoring at four locations
Residual Impact	No significant residual impact is anticipated	No significant residual impact is anticipated

Soil and Groundwater

A total of 10 soil samples were collected at five locations (at 1 mbgl and 5 mbgl) within the Project site. Five groundwater samples were also collected from new groundwater wells.

The results of the soil quality analysis were compared to the limits set out by DM-ED Information Bulletin No. 2 *Land Contamination Indicator Levels* (May 2003) and *Dutch Soil Remediation Circular* (2009). Soil quality results show that majority of parameters were not detected in concentrations above their respective minimum detection limits (MDL). Parameters that were detected in concentrations above MDLs were within their respective standard limits.

The groundwater laboratory data was compared against the Intervention Values specified in *Dutch Soil Remediation Circular* (2009), which is accepted by DM-ED. Groundwater samples recovered from the monitoring wells did not report any analytes above the Dutch (2009) Intervention Values with the exception of toluene (CAS 108-88-3), which was detected from the sample taken from well BH-2018-02 (near Parking Area). According to Zogorski et.al. (2006), the sources of most gasoline hydrocarbons in aquifers are probably releases of gasoline or

other finished fuel products. It is not possible to determine the exact cause of the elevated toluene concentrations from a single sampling event. However, it is likely highly that the source originates from the vehicles parked near the monitoring well. Further investigation of the source and extent of this impact is recommended.

Soil and Groundwater Assessment		
EIA Component	Construction Phase	Operation Phase
Impact Assessment	Typical impacts associated with construction activities include: • Land alteration • Soil erosion • Soil and groundwater contamination The risk associated with groundwater contamination is considered low for the following reasons: • The type of activities do not require or generate large amount of hazardous materials / wastes • The arid climate condition on-site, where there is no significant surface / stormwater flow that will infiltrate any contaminants into groundwater.	The operation of the Project is not considered to generate significant adverse impacts on the soil or groundwater condition. However, activities that have the potential to cause soil and/or groundwater contamination during the operation of the WtE plant include: • Leak or overflow of untreated sewage from sewage transfer infrastructure • Accidental spillage or leakage from storage of the feedstock on site (i.e. waste bunker) • Inappropriate storage of wastes (e.g. bottom ash and FGT residue) • Accidental spill or leakage from on-site bulk storage and handling of fuel and materials (i.e. aqueous urea solution, solid additives, adsorbent)
Proposed Management	• Implement erosion and sediment control plan • Progressive compaction and rehabilitation / lanscaping • Provide efficient temporary drainage system • Immediate clean-up of chemical and fuel spill • Implement appropriate hazardous waste / materials practices	• Appropriate design of on-site temporary bottom ash and FGT residue storage facilities • Implement soil and groundwater management (i.e. appropriately bunded areas, lined storage areas, etc.) • Appropriate waste management
Proposed Monitoring Programme	• Daily visual site inspection of potential soil contamination • Where dewatering activities are undertaken, sampling and testing will be undertaken on a monthly basis	• Regular inspection of waste management facilities • Daily visual site inspection of potential soil contamination • Quarterly sampling and groundwater analysis at one location

Soil and Groundwater Assessment		
EIA Component	Construction Phase	Operation Phase
Residual Impact	No significant residual impact is anticipated.	No significant residual impact is anticipated.

Biodiversity (Terrestrial Ecology)

A total of 39 species of flora and fauna were recorded at the Project site during the terrestrial survey, which was conducted from 19 to 20 August 2018 (two days and one night). The overall species richness of the area (approximately 3% of the total species of flora and fauna in the UAE) is considered to be very low.

Species identified at the Project site are not currently classified as threatened species under the IUCN 2018 Red List of Threatened Species, which suggests that only common and highly resilient species are present. All habitats identified on-site have a little conservation value. No threatened species or species that require specific habitat to survive are found.

Aquatic habitats are not present within or near the project site.

Biodiversity Assessment		
EIA Component	Construction Phase	Operation Phase
Impact Assessment	Vegetation clearing is an unavoidable impact. However, the impact on floral diversity is considered to be negligible given the plant species identified at the Project site. Further, the Project site has already been modified and disturbed and has limited conservation value. No threatened species or species that require specific habitat to survive are recorded for the project site.	No significant impact on flora and fauna is anticipated except for potential introduction of invasive species if waste is not properly managed.
Proposed Management	• Manage size of land disturbance for temporary construction laydown areas to minimum necessary • Reduce traffic speeds to prevent fauna injury and mortality	• Implement appropriate wheel washing of trucks prior to entering the site • Implement appropriate waste management plan
Proposed Monitoring Programme	• Visual observation on the presence of injured fauna	• Visual observation on the presence of injured fauna
Residual Impact	No significant residual impact is anticipated.	No significant residual impact is anticipated.

Access, Traffic and Transport

The proposed site is accessed via the existing E44 highway (or Al Khail Road or Dubai-Hatta Highway), a dual 4-lane highway that runs from the west to east. Other major routes to the west and east of the Project are E311 (Sheikh Mohammed Bin Zayed Road) and E611 (Emirates Road). The major roads surrounding the development include the Academic City Road to the south and the Al Awir Road to the north of the proposed development.

A Level 1 Traffic Impact Study was completed for the project.

From the E44 highway, the Project can be reached via D54 (or Sheikh Zayed Bin Hamdan Al Nahyan Street). The proposed development falls under medium industry with a total GFA of 58,089 m^2.

Traffic Assessment		
EIA Component	Construction Phase	Operation Phase
Impact Assessment	Construction activities will lead to a temporary increase in road traffic, which can potentially affect road safety at the Project site and nearby road networks if traffic is not properly managed. Transport requirements of the Project will comprise of daily transport of construction personnel to the Project site, delivery of construction materials and resources, delivery of site equipment and supporting facilities and collection of solid waste for off-site disposal. Potential impacts associated with the construction phase traffic include: • Increase in traffic congestion on the road network from Port Rashid leading to the Project site • Increased potential for vehicle accident / incident associated with a larger volume of traffic on the road network	Site access analysis has been carried out at the access points (1 and 2) to determine the impact of generated trips on the existing road traffic. The access locations are analysed using HCS 7 software. Site access analysis indicate that the access point will work at an acceptable level of service (LOS) for the opening year 2023 during AM and PM peak hours. The LOS are as follows: • Access 1: LOS A (AM) & LOS B (PM) • Access 2: LOS C (AM) & LOS B (PM)
Proposed Management	• Implement traffic management and access plan • Provide mass transport for workers	• Implement traffic management and access plan
Proposed Monitoring Programme	• Monitor traffic condition within the Project site	• Monitor traffic condition within the Project site
Residual Impact	An increase in traffic is an unavoidable but transient impact from the construction activities of the Project.	Residual impact is not anticipated as the LOS on the access roads (1 and 2)

Traffic Assessment		
EIA Component	Construction Phase	Operation Phase
		planned for the Project is considered sufficient.

Surface Water Resources

The nearest water body is the Al Warsan Lake located approximately 2.29 km west of the Project site. Al Warsan Lake is a wetland that has been created by taking treated effluent from the nearby Al Aweer STP and putting it in an unused quarry area (Nakheel, 2018). It is becoming home to various species of plants, animals, mammals, fish and reptiles.

The total installed desalination capacity available in Dubai is 470 million imperial gallons per day (MIGD) in addition to 32 MIDG from wells. Data shows that peak water demand increased by 2.96% (from 337 MIGD in 2015 to 347 MIGD in 2016). Residential areas consumed the most water in 2016 (60.72%) followed by commercial areas (26.57%).

Approximately 4.80 m^3/h of potable water will be used for domestic, sanitary as well as firefighing system while about 42.35 m^3/h (1 stream operation) or 76.06 m^3/h (2 stream operation) will be required for operation. Potable water will be sourced from DEWA while sewage treated effluent (STE) from Al Aweer Sewage Treatment Plant (STP) will be treated for WtE operation.

Surface Water Resources		
EIA Component	Construction Phase	Operation Phase
Impact Assessment	Potable water and water for domestic and other washing activities on-site will be supplied by existing DEWA facilities on-site.	Water discharges from the plant operation include process and softened water, which can be reused. As such, there is no water discharged from the WtE operation. Recycling and reusing water from Al Aweer STP provides benefits such as conservation of potable / freshwater supply, reduces water discharge into water bodies and provide economic benefits.
Proposed Management	Implement the following water conservation measures: • Use of water efficient devices and practices (i.e. high-pressure water for equipment cleaning) • Frequent site inspections of water leaks and wastage	• Water efficiency measures are adopted as early as the design phase and on an ongoing basis during the operation phase • Built-in water management measures are incorporated in the design of the WtE plant; as such wastewater discharge is not anticipated

Surface Water Resources		
EIA Component	Construction Phase	Operation Phase
	• Limit dust suppression to what is necessary • Provide employee training on water use behaviour and best practice procedures • Re-use water (if applicable)	
Proposed Monitoring Programme	• Keep record of water consumption	• Keep record of water consumption
Residual Impact	No significant residual impact is anticipated	No significant residual impact is anticipated

Energy Resources

In 2015, DEWA produced a total gross generation of 42,006,335 MWh of power, which was produced mainly through the use of natural gas (DEWA, 2015). The total installed capacity of the power plants is 10,000 Megawatts (MW), which is greater than the 2016 peak demand of 7982 MW.

DEWA annual statistics for 2016 indicate that the annual average electricity consumption in 2016 was 43,093 Gigawatt hours (GWh), with the commercial sector reported as having the highest consumption of electricity, followed by residential areas.

Energy Resources		
EIA Component	Construction Phase	Operation Phase
Impact Assessment	Power requirements will most likely be supplied through power generating units, which causes air pollution emissions. Construction utilities and equipment will also require regular delivery of fuel, which may potentially cause oil spills and VOC emissions.	The completion and operation of the proposed WtE plant is considered to have a significant positive impact in terms of energy sufficiency, diversification of energy resources and contribution of additional power supply to meet the demands of increasing population and growing economy. The WtE plant itself will operate from energy produced from the processing of MSW.
Proposed Management	• Reduce electricity use (i.e. switch-off light when not in use, using energy efficiency light bulbs) • Optimising energy efficiency (i.e. no idling of equipment, use of cleaner	Mitigation measure is not required as the impact is considered beneficial

Energy Resources		
EIA Component	Construction Phase	Operation Phase
	fuel, use of equipment fitted with pollution control devices, maintain equipment and vehicles as per manufacturer's recommendation, use main electricity or battery-powered equipment)	
Proposed Monitoring Programme	• Keeping record of fuel use • Environmental incident reporting (i.e. fuel / oil spill)	• Not applicable
Residual Impact	No significant residual impact is anticipated	There will be a net positive impact from the operation of the WtE plant

Waste Management

In reference to the Strategic Integrated Plan for Solid Waste (Master plan) prepared for DM Waste Management Department (WMD) by Mott MacDonald (May 2013), the approximate tonnes of construction and demolition (C&D) waste generated per 1 million AED spent is about 500 tonnes. This can be used as a benchmark for the total construction waste estimated to be generated from the project. However, as fabrication of the technology will be completed off-site, there may be less waste attributed to this project than per typical construction projects in the property and buildings development market.

Waste generation during the construction phase include:

- Food waste – 30 to 75 kg/day
- Solid waste – 30 to 75 kg/day
- Sewage – 125 to 300 m^3/day
- Mixed waste -11,520 m^3
- Metals – 3600 tonnes (entire construction period)
- Concrete – 22,000 m^3 (entire construction period)
- Wood – 6000 m^3 (entire construction period)

Waste generation during the operation phase include:

- Food waste – up to 60 kg/day
- Solid waste – up to 120 kg/day
- Wastewater – 70 to 103 m^3/day
- Incineration bottom ash (IBA) – 39,950 kg/h bottom ash from wet extractor at LPN, total for five lines; 282,269 tpa mineralic aggregates to be produces after pre-treatment, processing and maturation.
- Boiler ash (non-hazardous) – 985 kg/h at LPN, total of tfive lines

- Flue gas treatment (FGT) residue (including fly ash (hazardous waste)) – 310 t/day for five inceneration lines

Waste Management Assessment		
EIA Component	Construction Phase	Operation Phase
Impact Assessment	Without appropriate management, the generation, storage and disposal of construction waste may lead to (i) soil and groundwater contamination, (ii) dispersion of waste in and around the project site, (iii) odour from storage of putrescible waste and sewage storage tanks, (iv) hazards to fauna, and (v) hazards to health and safety.	The benefits of the operation of the Project with respect to waste include the reduction of waste disposed to landfills. The WtE plant can utilise typical MSW, refuse-derived fuel from a materials recovery facility as well as commercial and industrial wastes that may otherwise be disposed of in a landfill. Operational waste generated by the Project will form additional loads to existing waste infrastructure and utilities; however, will also reduce the load on waste management facilities in the Dubai Emirate. Impacts of operational waste (including bottom ash and flue gas treatment residue), if not properly managed, are similar to construction waste impacts.
Proposed Management	• Implement waste management system to include waste minimisation, reuse, recycle and appropriate disposal. • Provide spill kits and fire extinguishers • Provide training and personal protective equipment (PPE) for workers for proper handling, storage and disposal of wastes	• Manage waste deliverables and unloading areas • Maintenance of waste bunkers and receiving areas • Maintenance of leachate collection system • Establish a comprehensive waste management system • Provide suitable waste storage facilities • Train workers on the waste management requirements
Proposed Monitoring Programme	• Daily visual inspection of waste storage facilities • Maintain waste registers	• Daily visual inspection of waste storage facilities • Maintain waste registers
Residual Impact	Waste generation cannot be wholly avoided nor will waste be entirely recycled or reused. However, with	There will be a net positive impact from the operation of WtE plant because of the overall reduction of waste disposed to the landfill.

Waste Management Assessment		
EIA Component	Construction Phase	Operation Phase
	proper handling and disposal, there should be minimal residual impact.	

Landscape and Visual Amenity

A roadway borders the site to the north, such that there is about 300 to 400 m of separation from the proposed plant to the residential area (i.e. Residential Villas at Desert Palm Polo Club). Southerly facing view shows exiting power plant (i.e. DEWA) stacks beyond the site limits. Easterly facing view shows industrial sites beyond the project site. Westerly facing view show Dubai Textile City beyond Al Aweer STP and sludge disposal.

Landscape and Visual Amenity Assessment	
EIA Component	Construction / Operation Phase
Impact Assessment	Potential visual impacts associated with the Project include increase in the number of trucks transporting construction materials (during construction phase) and waste (operation phase). Increased in dust levels associated with the increased vehicle movement is also anticipated. Visual impact to the residential villa to the north of the site within Desert Palm Polo Club are anticipated to be minimal given the existing landscape screening.
Proposed Management	• Implement traffic management plan • Implement dust management plan • Implement the following measures to ensure impacts on visual amenity is mitigated: – Colours and similar cladding harmonized with the adjacent industrial sites – Maintenance of exterior facades of the building – Landscaping around the WtE plant
Proposed Monitoring Programme	Not applicable
Residual Impact	Residual impact is not anticipated

Land Use

The existing site is operational as a vehicle storage area and there are no receptors within the site footprint. According to DM Planning Department (2012), the Project site is categorised as Area 2 (Metropolitan Area) or areas where ongoing, onhold or deferred mega projects are planned. As detailed in Dubai 2020 Urban Masterplan (DM Planning Department, 2012), the Project site is classified under *'land for future development subject to environmental investigations and detail studies'*.

Based on existing land use, majority of the areas adjacent the Project site are industrial and commercial facilities. A number of residential, institutional and resource/attraction areas are also found surrounding the Project site. The nearest residential and resource / attraction areas are found around 300 to 400 m north of the site.

Land Use Assessment	
EIA Component	Construction / Operation Phase
Impact Assessment	The proposed WtE plant is not anticipated to have any impact on land use and is consistent with the land use classification. The classification of the site as *'land for future development subject to environmental investigation and detail studies'* is satisfied through the preparation of this EIA report. Therefore, based on existing land use and future land use development according to DM Planning Department (2012), no impacts are anticipated in terms of conflict in land use.
Proposed Management	Mitigation measure is not required as impacts on land use is negligible.
Proposed Monitoring Programme	Not applicable
Residual Impact	Not applicable

Protected Areas

The nearest protected area is the Al Wohoosh Desert Conservation Reserve located approximately 20 km east of the site.

Protected Areas Assessment	
EIA Component	Construction / Operation Phase
Impact Assessment	The Project is located around 20 km east of a designated protected area; as such, encroachment of the Project is not anticipated. Further, environmental and social impacts (e.g. air emission, noise generation) generated during the construction and operation phases is not anticipated to impact the protected areas.
Proposed Management	Mitigation measure is not required as impacts on protected areas is negligible.

Protected Areas Assessment	
EIA Component	Construction / Operation Phase
Proposed Monitoring Programme	Not applicable
Residual Impact	Not applicable

Socio-economic

In 2016, the population of the Emirate of Dubai was approximately 2.97 million (Dubai Statistics Center, 2017). Around 91.76% of the population comprises expatriates while the remaining 8.23% are Emiratis. The Project site is located in Warsan 2, Dubai (Sector 5), which had a population of 764 at the end of 2017 equivalent to 0.02% of Dubai's population. At the end of 2017, Dubai's population consisted predominantly of males (70.18%); about 58.46% are concentrated in the 25–44 age bracket; and total dependency ratio of 19%. Economic indicators show that majority of the workforce is male, while the education indicaor shows a very high literacy rate (97.4% in 2015) and good health and living condition indicators.

The Dubai Economic Profile (Department of Economic Development - Dubai (DED) 2016) shows that the Emirate of Dubai accounts for 30% of the UAE's total GDP. Since 2014, Dubai's GDP increased by 0.3% resulting in a growth rate of 4.1% in 2015 (DED, 2016). In 2016, the real GDP growth rate was 2.9% as opposed to 4.1% in 2015 (DED, 2017). Stimulant policies applied by the Federal Government and the Government of Dubai contributed in boosting the economy, and hence, the continuation of growth in all sectors (DED, 2017).

In 2016, the wholesale, retail and repairing services sector (27.6%) has been contributing the most to Dubai's GDP followed by transport sector (11.6%), financial activities (10.6%), while real estate and construction added 6.6% and 6.4%, respectively (DED, 2017).

Socio-Economic Assessment		
EIA Component	Construction Phase	Operation Phase
Impact Assessment	*Socio-economic impacts:* The peak of the construction is anticipated to employ approximately 2000 workers. The Project will generate demand for construction materials that can be acquired from local areas in the UAE thereby contributing to overall economic growth of Dubai. *Impacts on workers:* Workforce will be provided with labour accommodation. The workers and staff members could be exposed to various	*Socio-economic impacts:* Provision of long-term employment opportunities to local Emiratis and migrant workers is considered to be a beneficial direct impact. The operation of the WtE plant is anticipated to reduce Dubai's reliance on imported energy supply from the Emirate of Abu Dhabi. *Impacts on workers:* The operation and maintenance of the WtE plant has associated occupational

Socio-Economic Assessment		
EIA Component	Construction Phase	Operation Phase
	occupational and safety hazards, which are inherent to construction works. Migrant workers may be exposed to adverse working and living conditions *Conflict with community:* Workers will most likely be migrants and increase in population may have adverse impact on the local community if not adequately managed.	health and safety risks, which include exposure to air emissions, noise and heat, electrical hazards, among others. Workers will be provided with labour accommodation. Migrant workers may be exposed to adverse working and living conditions
Proposed Management	*Enhancement measures for positive impacts:* • Priority given to local workforce and local companies • Just and fair compensation to workers • Regular monitoring will be undertaken to ensure that rights of workers are protected *Mitigation measues for potential adverse impacts:* • Appointment of community liaison officer (or similar) to maintain good relationship with the community and other stakeholders • Develop grievance management procedure and ensure that all complaints are addressed • To minimise the impacts associated with the influx of additional foreign / expatriate workers, the Project should utilise the workforce currently and readily available in Dubai • Induction training will be provided to foreign workers to include understanding and respecting culture and religion in the UAE • Compliance with local and international labour and working condition guidelines • Compliance with local and international labour accommodation guidelines • Develop and implement Occupational Health and Safety Plan (OHSP)	
Proposed Monitoring Programme	• Construction labour monitoring procedures (observation of work and living sites, interviews with workers and management, review of employers' systems and documents i.e. time keeping and payment) • Review of grievance registration log	
Residual Impact	There will be a net positive impact from the Project construction activities through the provision of employment and business opportunities as well as simulations of the local and regional economy.	With the completion and operation of the Project, reliance on fossil fuel and imported energy (from Abu Dhabi Emirate) will be reduced, improving long-term revenues in the Emirate of Dubai.

Public Health

Health indicators show a very good health and living conditions in the Emirate of Dubai. Based on the record of Dubai Health Authority (cited in DSC, 2016), the leading causes of morbidity in 2016 is chickenpox (38%) followed by pneumonia (13%).

Public Health Assessment		
EIA Component	Construction Phase	Operation Phase
Impact Assessment	Increased community and occupational health and safety risk (air emission, noise, waste generation and increased traffic).	
Proposed Management	• Implement environmental management measures (air and noise control measures) • Implement occupational and community health & safety plan • Implement traffic management plan • Implement grievance mechanism to address community complaints (if any)	
Proposed Monitoring Programme	• Air quality (dust), odour and noise monitoring (refer to the tables above) • Daily occupational health and safety inspections	
Residual Impact	Residual impact is not anticipated	

Archaeology and Cultural Resources

The proposed WtE plant will be located in a disturbed environment surrounded by industrial and commercial (i.e. warehouse and stores) facilities. All the archaeological and cultural resources identified by the Government of Dubai, represented by Dubai Culture, are considerably distant from the WtE plant.

Archaeology and Cultural Resources Assessment		
EIA Component	Construction Phase	Operation Phase
Impact Assessment	All the archaeological and cultural resources are considerably distant from the WtE plant and are not anticipated to be affected during the construction and operation of the Project.	
Proposed Management	No mitigation is required since the Project is not likely to have any impact on archaeological and cultural resources. Nonetheless, the Proponent will report any accidental findings to the relevant authorities (e.g. DM-Architectural Heritage and Antiquities Department, AHAD). Chance find procedures will therefore be developed and included in construction and operations management plans in case of chance findings of archaeological and cultural significance.	
Proposed Monitoring Programme	Not applicable	
Residual Impact	Not applicable	